

# **EXHIBIT B**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re patent application:

Appl. No. : 09/523,185  
Applicant : Alexander L. Cheng  
Filed : March 10, 2000  
Art Unit : 2661  
Examiner : Bob A. Phunkulh  
Attorney Docket No. : PARAL - 1  
Date : September 15, 2003

**AMENDMENT**

Mail Stop Non-Fee Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This communication is submitted in response to the Office Action dated June 13, 2003. A response is due on September 13, 2003, which falls on a Saturday, so a response filed on September 15, 2003 is timely filed. Please amend the above-identified patent application as follows:

- **Amendments to the Specification;**
- **Amendments to the Claims; and**
- **Remarks/Arguments** begin on page 12 of this paper.

**CERTIFICATE OF TELEFAXING:**

I hereby certify that this correspondence is being telefaxed to the United States Patent and Trademark Office at:

**703-872-9326**  
Mail Stop Non-Fee Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

on September 15, 2003  
Date of Deposit

  
Signature

Alexander L. Cheng  
Name of Applicant

September 15, 2003  
Date

**Amendments to the Specification:**

Please amend the specification as shown below.

Please amend the Abstract of the Invention section as follows:

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**ABSTRACT**

~~A method and apparatus is disclosed for improving quality of service (QoS) by parallel operation in a multiple access network.~~

~~A communication system comprises a plurality of communicating nodes and communication facilities linking these nodes. The communication facility is constructed so that it has more than one channel for communication among these communicating nodes using many different means, such as with separate time slots, different frequency bands, coding scheme, separate physical media, or a combination of the above. Each node is assigned a regular communication channel and a contention resolution channel. In some cases, these two types of channels can be one and the same.~~

~~When a collision is detected by the communicating nodes, nodes engaged in the contention switch to the contention resolution channel for contention resolution process while nodes not engaged in the contention continue their normal operation in the regular channel. After the contention is resolved and communication is accomplished, the nodes that have switched will switch back to their regular channel. Any nodes with existing protocol will simply stay on the regular channel and resolve the contention in the existing fashion. Therefore, backward compatibility is achieved.~~

~~A system is disclosed that~~The present invention improves quality-of-service (QoS) by parallel operation in a multiple access network and offers a flexible way to adjust for network performance by dynamically allocating channels to be assigned dynamically to communicating nodes. The multiple access operation is improved via parallel operation for non-contending nodes, and smaller group of nodes for contention resolution. When a collision is detected by the communicating nodes in a

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communication system, nodes engaged in a contention switch to a contention resolution channel to resolve contention while nodes not engaged in the contention continue their normal operation in the regular channel. After the contention is resolved and communication is accomplished, the nodes that have switched will switch back to their regular channel. Support of different service quality levels based on varying group size is made possible in a multiple access network while providing compatibility with existing protocol. The present invention offers a smooth growth path for protocol and network facility.

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Please add the following section before the Brief Description Of The Drawings on page 4:

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A method and apparatus is disclosed for improving quality-of-service (QoS) by parallel operation in a multiple access network.

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A communication system comprises a plurality of communicating nodes and communication facilities linking these nodes. The communication facility is constructed so that it has more than one channel for communication among these communicating nodes using many different means, such as with separate time slots, different frequency bands, coding scheme, separate physical media, or a combination of the above. Each node is assigned a regular communication channel and a contention-resolution channel. In some cases, these two types of channels can be one and the same.

When a collision is detected by the communicating nodes, nodes engaged in the contention switch to the contention-resolution channel for contention resolution process while nodes not engaged in the contention continue their normal operation in the regular channel. After the contention is resolved and communication is accomplished, the nodes that have switched will switch back to their regular channel. Any nodes with existing protocol will simply stay on the regular channel and resolve the contention in the existing fashion. Therefore, backward compatibility is achieved.

The present invention offers a flexible way to adjust for network performance by

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dynamically allocating channels to be assigned dynamically to communicating nodes. The multiple access operation is improved via parallel operation for non-contending nodes, and smaller group of nodes for contention resolution. Support of different service quality levels based on varying group size is made possible in a multiple access network while providing compatibility with existing protocol. The present invention offers a smooth growth path for protocol and network facility.

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Please add the following section at the end of the Brief Description Of The Drawings on page 4:

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Figure 3 illustrates a flow diagram of the operation of an apparatus for parallel operation in a multiple access network.

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Please add the following section after the second full paragraph on page 5:

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Figure 3 shows one embodiment of the system according to the present invention, which discloses a method and apparatus for parallel operation in a multiple access network having a plurality of communicating nodes and communication network facilities. This Figure does not necessarily set forth all of the steps associated with the system of the present invention, steps can be added and steps can be removed. One embodiment for parallel operation in a multiple access network having a plurality of communicating nodes and communication network facilities can include the following steps: a) allocating a plurality of communicating channels some or all of which may be used as spare contention resolution channels, in addition to a regular communicating channel or channels not allocated for contention resolution (step 310); b) assigning from the plurality of communicating channels dynamically to communicating nodes, which have implemented an improved protocol for a contention resolution process (step 320); c) detecting contention (step 330); d) determining whether nodes have implemented an improved protocol (step 340); e) switching to assigned contention resolution channels upon detecting contention for nodes which have implemented an improved protocol and are involved in a contention (step 350); f) staying on the original

channel (or channels not allocated for contention resolution) for nodes which have not implemented an improved protocol or are not involved in a contention (step 380); g) performing contention resolution process on the assigned contention resolution channels (step 360) in parallel to the normal process on the regular channel or channels not allocated for contention resolution (step 390); and h) reverting back to the regular channel or channels not allocated for contention resolution upon completion of the contention resolution process for the nodes which have switched to an assigned contention resolution channel and resuming normal process (step 370).

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In this method and apparatus of parallel operation in a multiple access network, the step of allocating contention resolution channel can include allocating using: a) dedicated time slots; b) using separate frequency bands; c) coding scheme; or d) separate physical communication facility. The step of allocating contention resolution channel can ensure compatibility and non-interference with the regular communicating channel. In this method and apparatus, the step of staying on the original channel can include the step of maintaining the operation of existing protocol for communicating nodes which have not implemented the improved protocol or have not been involved in a contention. The step of performing the contention resolution process can include: a) implementing an improved contention resolution protocol; and/or b) maintaining the existing protocol as on the regular channel.

The apparatus of parallel operation in a multiple access network having a plurality of communicating nodes and communication network facilities includes: a) allocating means for allocating a plurality of communicating channels in addition to a regular communicating channel, some of which may be used as spare contention resolution channels; b) assigning means for assigning from the plurality of communicating channels dynamically to communicating nodes which have implemented improved protocol for contention resolution process; c) switching means for switching to assigned contention resolution channels upon detecting contention for nodes which have implemented improved protocol and involved in the contention; d) means for staying on the original channel for nodes which have not implemented improved protocol or are not involved in the contention; e) contention resolution means for

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A4* performing contention resolution process on the assigned contention resolution channels in parallel to the normal process on the regular channel; f) reverting means for switching back to the regular channel upon completion of contention resolution process; and g) resuming means for resuming normal process.

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**Amendments to the Claims:**

This listing of claims will replace all prior versions of claims in the application:

**Listing of Claims:**

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1. (Currently Amended) A method of parallel operation in a multiple access network having a plurality of communicating nodes and communication network facilities comprising the steps of:
- (a) allocating a plurality of communicating channels ~~in addition to a regular communicating channel some of which may be used as spare contention resolution channels;~~
  - (b) assigning ~~from~~ selected ones or all of said plurality of communicating channels dynamically to communicating nodes which have implemented an improved protocol for contention resolution process;
  - (c) switching to said assigned contention resolution channels upon detecting contention; ~~for nodes which have implemented improved protocol and involved in said contention;~~
  - (d) staying on ~~said original channels~~ not allocated for contention resolution for nodes which have not implemented said improved protocol or ~~have~~ are not involved in said contention;
  - (e) performing contention resolution process on said assigned contention resolution channels in parallel to a the normal process performed on said channels not allocated for contention resolution on said regular channel;
  - (f) reverting back to ~~said regular channels~~ not allocated for contention resolution upon completion of contention resolution process for said nodes which have switched to said assigned contention resolution channels; and
  - (g) resuming normal process.



2. (Currently Amended) ~~In a~~A method of parallel operation in a multiple access network according to claim 1, wherein said step of allocating contention resolution channels comprises~~ing the step of allocating using~~ dedicated time slots.
3. (Currently Amended) ~~In a~~A method of parallel operation in a multiple access network according to claim 1, wherein said step of allocating contention resolution channels comprises~~ing the step of allocating using~~ separate frequency bands.
4. (Currently Amended) ~~In a~~A method of parallel operation in a multiple access network according to claim 1, wherein said step of allocating contention resolution channels comprises~~ing the step of allocating using~~ coding schemes.
5. (Currently Amended) ~~In a~~A method of parallel operation in a multiple access network according to claim 1, wherein said step of allocating contention resolution channels comprises~~ing the step of allocating using~~ a separate physical communication facility.
6. (Currently Amended) ~~In a~~A method of parallel operation in a multiple access network according to claim 1, wherein said step of allocating contention resolution channels further comprises~~ing the step of ensuring compatibility and non-interference of said contention resolution channels with said regular communicating channels not allocated for contention resolution~~.
7. (Currently Amended) ~~In a~~A method of parallel operation in a multiple access network according to claim 1, wherein said step of staying on said channel not allocated for

~~contention resolution original channel~~ further comprises ~~comprising the step of maintaining the operation of an existing protocol for communicating nodes which have not implemented the said improved protocol or have are not been involved in said contention.~~

8. (Currently Amended) In a method of parallel operation in a multiple access network according to claim 1, wherein said step of performing contention resolution process further comprises ~~the step of implementing an improved contention resolution protocol.~~
9. (Currently Amended) In a method of parallel operation in a multiple access network according to claim 1, wherein said step of performing contention resolution process further comprises ~~the step of maintaining said the existing protocol as on said regular channels not allocated for contention resolution.~~
10. (Currently Amended) An apparatus ~~effor~~ parallel operation in a multiple access network having a plurality of communicating nodes and communication network facilities, said apparatus comprising:
- (a) ~~allocating~~ means for allocating a plurality of communicating channels in addition to a regular communicating channel ~~some of which may be used as spare contention resolution channels;~~
  - (b) ~~assigning~~ means for assigning ~~from selected ones or all of~~ said plurality of communicating channels dynamically to communicating nodes which have an implemented improved protocol for contention resolution process;
  - (c) ~~switching~~ means for switching to said assigned contention resolution channels upon detecting contention ~~for nodes which have implemented improved protocol and involved in said contention;~~
  - (d) means for staying on ~~said original channels not allocated for contention resolution~~ for nodes which have not implemented said improved protocol or ~~have are~~ not involved in said contention;

- (e) ~~contention resolution means for performing contention resolution process on said assigned contention resolution channels in parallel to a the normal process performed on said channels not allocated for contention resolution on said regular channel;~~
- (f) means for reverting meaning for switching back to said regular channels not allocated for contention resolution upon completion of contention resolution process;  
and
- (g) ~~resuming means for resuming normal process.~~
11. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for allocating contention resolution channels comprises using dedicated time slots.
12. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for allocating contention resolution channels comprises using separate frequency bands.
13. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for allocating contention resolution channels comprises using coding schemes.
14. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for allocating contention resolution channels comprises using a separate physical communication facility.
15. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for allocating contention resolution channels further comprises means for ensuring compatibility and non-interference of said contention resolution channels with said channels not allocated for contention resolution.

16. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for staying on said channels not allocated for contention resolution further comprises means for maintaining an existing protocol for communicating nodes which have not implemented said improved protocol or are not involved in said contention.
17. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for performing contention resolution further comprises means for implementing an improved contention resolution protocol.
18. (New) An apparatus for parallel operation in a multiple access network according to claim 10, wherein said means for performing contention resolution further comprises means for maintaining said existing protocol as on said channels not allocated for contention resolution.
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**Remarks/Arguments**

**1. Status of Claims**

Claims 1-18 are pending in this application. Applicant has amended claims 1-10, and added claims 11-18 to better define Applicant's invention. Applicant respectfully requests entry of the above amendments and consideration of the enclosed remarks. Applicant submits that no new matter is added. Accordingly, claims 1-18 will remain pending in the application.

**2. Objection to the Abstract**

On page 2 of the Office Action, the Examiner objected to the Abstract. Applicant has amended the Abstract and respectfully requests that the Examiner withdraw the objection.

**3. Objection to the Specification**

On page 2 of the Office Action, the Examiner objected to the specification as failing to provide proper antecedent basis for the claimed subject matter "implemented improved protocol". Applicant has added sections to the specification. Applicant submits that these sections reflect the disclosure found in the Abstract and Claims as originally filed with the Patent Office and which are considered part of the specification as filed. Accordingly, Applicant submits that no new matter is added to the specification and the specification provides proper antecedent basis for "implemented improved protocol." Applicant respectfully requests that the Examiner withdraw the objection.

**4. Objection to the Oath/Declaration**

On pages 2-3 of the Office Action, the Examiner objected to the declaration that was filed with this application. Applicant is filing an updated declaration along with this response to the Office Action, and Applicant respectfully requests that the Examiner withdraw the objection.

**5. Objection to the Drawings**

On page 3 of the Office Action, the Examiner objected to the drawings as not describing every feature of the invention cited in claim 10. Applicant has submitted a proposed drawing change by adding Fig. 3 to address the Examiner's objection. Fig. 3 has been added as an appendix to this office action response. Applicant has also added a detailed description in the specification describing Fig. 3. Applicant submits that the matter disclosed in Fig. 3 finds support in the claims as originally filed with the Patent Office, which are considered part of the specification as filed. Accordingly, Applicant respectfully submits that no new matter is added to this application and Applicant respectfully requests that the Examiner withdraw the objection.

**6. Rejections under 35 U.S.C. §112**

On page 3 of the Office Action, the Examiner objected to claim 10 because of the informality in step f, where the word "meaning" should be corrected to "means". Applicant has amended the claim to address the Examiner's objection and respectfully requests that the Examiner withdraw the objection.

**7. Rejections under 35 U.S.C. §112**

On pages 3-4 of the Office Action, the Examiner rejected claims 1-9 under 35 U.S.C. §112 as allegedly narrative in form and replete with indefinite and functional or

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operational language, and claim 1 did not provide proper antecedent basis for the recited limitation "said original channel". Applicant has amended claims 1-9 for cosmetic reasons. Applicant respectfully submits that amended claims 1-9 satisfy 35 U.S.C. §112, second paragraph. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claims 1-9.

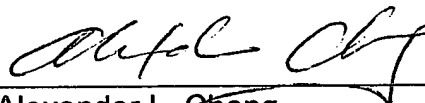
**8. Allowable Subject Matter**

Applicant thanks the Examiner for finding allowable subject matter. Claims 1-10 were identified as being allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. §112, second paragraph. In this amendment, claims 1-10 have been amended and Applicant respectfully requests that the Examiner allow these claims.

**9. Conclusion**

In view of the foregoing amendments and remarks, it is respectfully submitted that claims 1 - 18 of this application are in condition for allowance, and favorable action thereon is requested. If the Examiner finds reason not to allow all claims, then Applicant respectfully requests a telephone interview.

Respectfully submitted,



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Fig. 3

